

### **ABSTRACT OF THE INVENTION**

A power distribution assembly (PDA) includes a plurality of power modules that are installed within a chassis that is mounted to a vehicle, such as an aircraft. The power modules are used to control aircraft systems such as braking, navigation, or temperature control systems. The PDA includes first and second microprocessors that have separate serial busses that are in communication with each of the power modules. A first power supply powers the first microprocessor and each of the power modules and a second power supply powers the second microprocessor and each of the power modules independently from the first power supply. Additionally the first and second microprocessors communicate with each other via both serial busses to determine which microprocessor is in active control and which microprocessor is on standby in addition to monitoring the health of the other microprocessor. The microprocessors can be used to provide command signals to satellite power distribution assemblies having satellite power modules for controlling additional aircraft systems. This configuration allows smaller satellite power distribution assemblies to be incorporated into the aircraft, which facilitates installation and provides more flexibility.